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SAFETY ELEMENT

of The

ARVIN

GENERAL PLAN

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SAFETY
ELEMENT

SE-75-11

general plan element for

the city of Arvin

[Arvin. City council]
city planning Arvin
Emergency relief "
Fire prevention "

Prepared by the
KERN COUNTY COUNCIL OF GOVERNMENTS

Kern County, California

1975

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The element of the general plan is an emergency plan for the protection of the city from fires and geologic hazards. It includes procedures to be followed in the event of a disaster likely to arrive with little warning, having a rapid development and having a potential for substantial destruction. Considered are such features as 1) evacuation and access routes, 2) peak load water supply requirements, 3) minimum road width, 4) clearance around structures, and 5) geological hazard mapping in areas of known geologic hazards. This element injects emergency safety considerations into the planning process in an effort to reduce loss of life, injuries, damage to property, and economic and social disruption.

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CERTIFICATION OF ADOPTION

BY THE

PLANNING COMMISSION

We hereby certify that this document, text, accompanying tables and maps constitute a Safety Element of the City of Arvin General Plan as required by Section 65302.1 of the Government Code, State of California. This "Safety Element" being proposed as a part of the adopted General Plan for the City of Arvin was approved and adopted by Resolution No. 8-75 of the Arvin Planning Commission at its regular meeting of the 12th day of Aug. 1975, after conducting a public hearing pursuant to Section 65351 of the Government Code, State of California.

Clifford Armstrong
Chairman
Arvin Planning Commission

City Planner
Arvin Planning Commission

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CERTIFICATION OF ADOPTION

BY THE

CITY COUNCIL

We hereby certify that this document, text accompanying tables and maps constitute a Safety Element of the City of Arvin General Plan as required by Section 65302.1 of the Government Code, State of California. This "Safety Element," proposed as a part of the General Plan, was reviewed by the Planning Commission; said Commission made its recommendation to this council; this council adopted the Safety Element by Resolution No. 39-75of the Arvin City Council, at its regular meeting of 8th day of Sept. 1975, after conducting a public hearing pursuant to Section 65351 of the Government Code, State of California.

Frank Gipson
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City of Arvin

City Clerk
City of Arvin

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INTRODUCTION

The Safety Element of the General Plan was conceived as a vehicle for county and city governments to respond to the needs of local communities for safe and orderly growth. It relates to emergency conditions that may be caused by natural disasters such as earth rupture, landslides, fire, floods, and man-made catastrophes such as nuclear explosions. Because this element was made a mandatory part of the cities' general plan by State legislators,[1] and has been adopted by the City, it must be considered when land use patterns are determined. Provisions of the element must be included in subdivision design and all other development for protection of the community from fires, floods, and geologic hazards. The plan includes features necessary for establishing evacuation routes, peak load water supply requirements, minimum road widths, clearances around structures, and geologic hazard mapping in areas of known geologic hazards.

On December 31, 1970 the President signed Public Law 91-606, the Disaster Relief Act of 1970. In addition to providing for a comprehensive program of assistance in major disasters, the Act directs that a full and complete investigation and study be conducted to determine what additional improvement could be made to prevent or minimize loss of life and property due to major disasters.

In response, the states, counties, and cities have developed and adopted coordinated disaster preparedness plans. The County Department of General Services has a full time superintendent of Emergency Services who coordinates local programs with cities within Kern County, and adjacent counties, as well as state and federal agencies.

This element of the City's General Plan must be consistent with the existing disaster preparedness plan. It should reinforce and augment such plans by providing standard policies and procedures for adoption by the City. It should give some direction to present and future land use patterns. To succeed, the disaster preparedness program must have the support of the community, scientific and engineering professions, and government at all levels.

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1 Section 65 302.1 Government Code, State of California

*This element is divided into two volumes. Volume I contains the Safety Element while Volume II contains background material.

RELATIONSHIPS OF THE SAFETY ELEMENT

1. To Other Elements of the General Plan

The Safety Element contributes to the planning process by developing land use standards and policies necessary to determine land use patterns. These standards relate the type and intensity of land use to the level of risk from fire and geologic hazards. They identify the effect of development as it relates to risk and indicate the availability of service facilities necessary to combat hazardous conditions.

The Safety Element also contributes information on the comparative safety of various land uses, types of structures and occupancies. It provides primary policy inputs to the land use, housing, open space, conservation, circulation and seismic safety elements. This element should not be in conflict with policies and objectives of these other elements but must compliment them and be consistent with them.

2. To Environmental Factors

a. Physical: Geologic hazards and fires can be prime determinants of land use capability.

b. Social: This element provides the basis for evaluating the costs of social disruptions, including possible loss of life due to geologic and fire hazards. It identifies means of mitigating social impact and provides an increasing sense of community security and well-being.

c. Economic: Cost and benefits of using, or of not using various areas is related to potential damage and to the cost of overcoming the hazards. This element should be directed at reducing costs of direct property loss and dislocation.

d. Environmental Impact Report: Provides policy directives basis for the evaluation of the environmental impact of proposed projects in relation to slope and soil stability, possible structural failure, fire and similar factors. It should evaluate adverse impacts on both the built and natural environments of major safety hazards.

3. To Other Agencies

The federal, state, county, and cities have responsibilities in coordinating their disaster plans. They stress the overall theme of partnership in achieving important disaster preparedness.

Planning is essential for any region or community likely to be affected by a disaster, in order to determine what preventive and protective measures can and should be taken before and at the time of a disaster. Planning requires cooperation from all levels of government. A prerequisite to such planning is a determination of vulnerability of a given area to particular types of disasters. In this regard, federal agencies are helping and can do more to assist—the states and local governments.

State disaster planning is uneven in coverage and quality. It should, above all, be more concerned with the needs of local communities, with greater emphasis on preparedness or predisaster actions.

PART ONE

THE SAFETY ELEMENT

OF THE

ARVIN GENERAL PLAN

A. SUMMARY

1. Objectives

The objective of this element is to introduce safety considerations in the planning process in order to reduce loss of life, injuries damage to property, and economic and social dislocation resulting from fire and dangerous geologic occurences.

2. Policies

Safety Hazards: While it is impractical to set as our goal, the development of a risk free society it is evident that there are hazards in the city that can and should be eliminated. The following policies are adopted to provide guidance to the decision-makers for the planning of safer communities and abatement of hazards.

a. Provide a disaster management system embodying all aspects of predisaster preparedness and post disaster response in accordance with established risk standards.

b. Plan land uses so areas of natural hazards are not developed with high population densities.

c. Conduct periodic fire and other types of building inspections, on an annual basis.

d. Conduct a public awareness program with property owners and with the general public, through the news media, to create public awareness and subsequent hazard reduction.

e. Determine conformance with community standards and prepare priority list of structural problems that don't conform to standards.

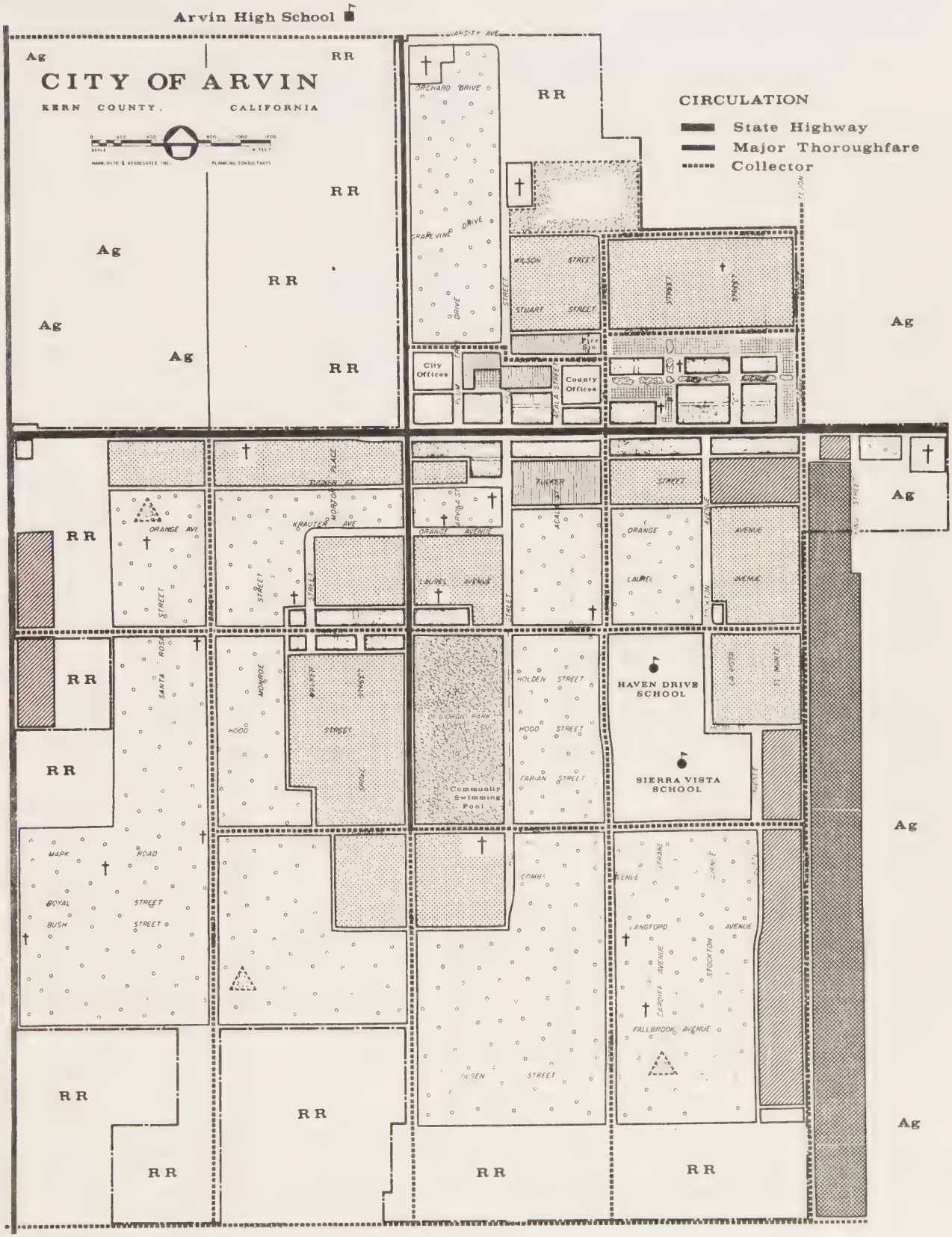
f. Conduct an ongoing program for the correction of sub-standard conditions.

g. Expand routine emergency services, such as firefighting, sanitation, and police.

h. Prepare for prompt and effective rescue, care and treatment of persons victimized or threatened by disaster.

i. Carry out drill programs at schools, hospitals, and public buildings to train the occupants and staff in emergency techniques.

GENERAL PLAN



RESIDENTIAL

		Units / Acre
	Low Density	4 - 6
	Medium Density	8 - 12
RR	Residential Reserve	

COMMERCIAL

- Retail
- Heavy
- Office
- Shopping Mall

PUBLIC

- High School
- Elementary School
- Existing Park
- Proposed Parks
- Name Other

OTHER

- Industrial
- Ag Agriculture
- † Church
- Parking

B. SURVEY OF EXISTING CONDITIONS

1. Fire Hazards

The following goal and policies are adopted as guides for the plan development and implementation:

a.) Goal - Protect the health, safety, and welfare of the people from fire.

b.) Policies

1.) Provide fire control service capable of responding quickly and efficiently to meet any emergency.
2.) Prevent fires through an ongoing program of education, inspection, and abatement.
3.) Provide sufficient equipment and manpower to adequately respond to fire alarms in all parts of the city.
4.) Insure that buildings are designed and equipped for an adequate level of fire protection.
5.) Insure that Fire Department personnel are trained to meet all situations under their jurisdictions.
6.) Promote and encourage adequate fire control within the entire sphere of influence, including:

Establish and maintain evacuation routes.
Require minimum road widths.
Provide for peak load water supply.
Require minimum clearance around buildings.

7.) Promote all reasonable interjurisdictional cooperation plans.
8.) Promote community education and understanding of the functions and responsibilities of the Fire Department and of the citizens themselves.

c.) Standards

Cul-de-sacs present a hazard in terms of equipment movement. This situation could be improved if the minimum right of way width of 60' is established and the radius of the circular end of a cul-de-sac were at least 40 feet in length. If the distance from the circular end of a cul-de-sac to the nearest fire hydrant exceeds 200 feet a hydrant should be installed at the end of the cul-de-sac. Thirty-two feet is the minimum width for a cul-de-sac or loop road as well as for all residential roads.

Distance from fire trucks to a fire in an apartment-house complex also creates problems. If the actual distance a hose must be hand-laid is over 200 feet, it is too time consuming and suppression efforts are delayed. The needs of emergency equipment should be a factor considered in site plan design and approval.

Peak Water Supply Requirements. The emergency water supply for a structure should be a flow of 500 gallons per minute (gpm) in residential areas, 1,000 gpm in commercial areas, and 1,500 gpm in industrial areas. The peak demand rate is the peak domestic flow or the fire flow plus one-half the peak domestic load which ever is greatest. The water supply system of the city should meet these requirements.

d. Previous Planning

a.) Interjurisdictional Cooperation: Detailed interjurisdictional assistance plans have been in existence for many years. They were designed to meet the requirements of the Office of Emergency Services.

b.) Fire Insurance Rating: The fire insurance rating for the city is as low as is economically feasible. The city has a class 5 rating.

c.) Fire Protection Districts have been established in some areas of the county. The Arvin Fire Protection District was established under the Local Fire District Law set out in Chapter 1 (commencing with Section 14000 of Part 3 of Division 12 of the Health and Safety Code).

The remaining fire protection districts in Kern County were established under Chapter 2 (commencing with Section 14400 of Part 3 of Division 12 of said code).

The Fire Protection District Law of 1961 (Health and Safety Code Section 13801 and following) was enacted by Statutes 1961, Chapter 565. This statute also enacted Sections 14022 and 14407 which provided for an automatic reorganization under the Fire Protection District Law of 1961 of those fire protection districts previously organized under said Chapters 1 and 2 above noted. Sections 14022 and 14407 have now been repealed but the reorganization of all Kern County fire protection districts under the Fire Protection District Law of 1961 was complete before the repeal and, accordingly, such reorganization was not affected by the subsequent repeal of these sections.

The Kern County Board of Supervisors comprises the board of directors of all of the fire protection districts with the exception of Arvin which is now an inactive district.

In addition to its general powers a Fire Protection District has the following powers provided by statute: (Numerical references are to sections of the Health and Safety Code)

Establish, equip and maintain a fire department. [13852 (d)] Provide any special service function necessary for fire prevention and protection. [13852 (h)]

Acquire and construct facilities for development, storage and distribution of water for the purpose of providing fire protection. [13852 (i)]

Acquire and maintain ambulances and operate ambulance service. [13853] Establish, maintain and operate first aid services. [13854] Clear or order the clearing of inflamable growths or materials from lands within the district which cause fire hazards. [13867, 13868]

Adopt and enforce ordinances for the prevention and suppression of fires and for protection of life and property against fire hazards. [13869]

Cause an ad valorem tax to be levied and collected. [13907]

2. Natural Hazards

a. Geologic hazards. The Seismic Safety Element adopted by the city as a part of their general plan, gives a thorough treatment of this hazard. To avoid duplicating that element, the reader should refer to it, for the standards and detailed information related to seismic safety. Only specific hazards that have been identified within the city are shown on page 37 of this report. The following goal and policies are adopted as a guide for the plan development and implementation.

(1) Goal - Protect the health, safety, and welfare of the people from natural causes related to earthquake.

(2) Policies

(a) Require an overall disaster plan.
(b) Maintain an adequate emergency control center.
(c) Prevent injury and economic loss.
(d) Ensure that the city's facilities, equipment and supplies are protected.
(e) Require evacuation routes and maintain and develop road widths compatible with emergency equipment.
(f) Ensure peak load water supply.
(g) Encourage community education and understanding of the potential risk from natural causes.

b. Flood hazard. The following goal and policies are adopted as a guide for plan development and implementation.

(1) Goal - To provide and maintain flood control protection for the safety, health, and general welfare of the public in keeping with the degree of risk the community is willing to support.

(2) Policies

(a) Support the efforts of the city to provide continuing protection from potential flooding.
(b) Discourage land uses inconsistent with the floodplain hazard but, encourage open-space uses consistent with the character of the floodplain.

3. Man-Made Hazards

a. Goal - Protect the health, safety and welfare of the people from man-made causes.

b. Policies
   (1) Insure that buildings are designed and equipped so an adequate level of protection is maintained.
   (2) Require new construction to adhere to the Uniform Building Code.
   (3) Encourage community education and understanding of the risks related to:
   - Atomic energy plants
   - Refineries
   - Dams
   - Factories and processing plants

C. IMPLEMENTATION

1. Introduction

Recognizing that there are limits to what a city can do to help itself, the city has become a part of a master mutual aid plan which pledges its help to sister communities when, because of the size of the catastrophe, they have a need for outside help. They, in turn, are pledged to help us if and when we, too, require such assistance.

Maintaining a high degree of disaster readiness, however, is largely a question of attitude, and the building of a proper attitude throughout the city governmental structure begins at the top where policy is established. It isn't enough for the legislative body of the community, in our case, the City Council, to only pass an ordinance establishing an emergency preparedness program. The City Council must show an interest in the ongoing activities as well. It should require a good disaster plan to be submitted for its approval. It should insist that the plan is not only kept up to date, but fully utilizes the available resources as well. The Council should also make it possible for city personnel to receive a reasonable amount of training in carrying out their disaster assignments and insist that such training be realistic and of a team-building character. Disaster exercises should be held periodically.

2. Emergency Operational Center

It is essential to have a central place such as a well-protected emergency operating center where timely decisions based on accurate information can be well coordinated and then disseminated. It is at the Emergency

Operating Center where actions are taken to ascertain what resources are available. Key officials with various resources at their immediate command can put their heads together and make the extraordinary judgements required to overcome the extraordinary problems which make a disaster a disaster.

Too much stress cannot be put on the need for good communications. Ties to key hospitals with a radio system in the city is important. A closely working relationship with extensive group of amateur radio operators and with certain critical industries is vital. But no communication system is complete unless it also provides a means to broadcast important information and instructions to the public.

The fact that good training offers the greatest return for the time and energy invested is reason to merit the greatest staff effort.

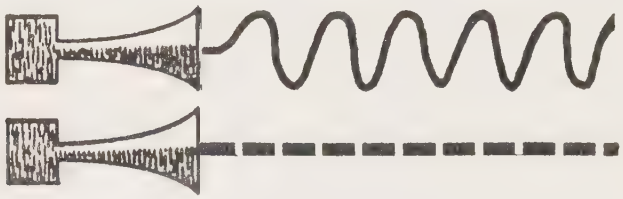
Plans must be made in order to provide shelter for people rendered homeless due to disaster. The city counts heavily on the Red Cross to furnish the leadership and much of the staffing. It isn't proper to just dump the whole load in their laps. Planning should be worked out jointly as a team effort. The Red Cross staff must be augmented by making available the city's entire roster of employees. A staff of trained personnel must be immediately available to man sufficient predesignated elementary schools and recreational centers to house disaster victims. All of the assigned facilities should have cafeterias, toilets, and sleeping space to house the homeless in reasonable comfort. If necessary, the city's entire system of school facilities can be made available and with additional staffing provided by the various school faculties, it would be possible to house the homeless.

3. Warning System. In cases of a disaster people in the path must be warned and evacuated. Signals are given and evacuation routes are made at the discretion of authorized fire or police personnel.

Alert Signal System

An Attack Warning signal and an Attention or Alert signal have been established by the Defense Civil Preparedness Agency (DCPA).

The ATTACK WARNING SIGNAL. This is a 3 to 5 minute wavering sound on sirens, or a series of short blasts on whistles, horns, or other devices, repeated as necessary. The Attack Warning Signal means that an actual enemy attack against the United States has been detected, and that protective action should be taken immediately. This signal has no other meaning and will be used for no other purpose.



The ATTENTION Or ALERT SIGNAL. This is used by some local governments to get the attention of citizens in a time of threatened or impending natural disaster, or some other peacetime emergency. This signal is a 3 to 5 minute steady sound on sirens, or with whistles, horns, or other devices. In most places, the Attention or Alert Signal means that local government wants to broadcast important information on radio or television concerning a peacetime disaster.

Alert Broadcast System

The Emergency Broadcast System (EBS), composed of non-government radio and television stations, is designed to transmit emergency Presidential messages, or national, state, or local area news, information and instructions to the public in a broad range of emergency contingencies.

The EBS may be activated by the President to address the public in a major emergency, or its facilities may be used on a state or areawide basis by participating broadcasters to transmit instructions in day-to-day emergency situations posing a threat to life and property. These latter may include tornado warnings or sightings, flash flood warnings, threats from major fires or industrial accidents, developing severe weather conditions and the like.

EBS stations periodically conduct tests of emergency procedures and instruct the public on actions to be taken to tune in on EBS in an emergency.

4. Evacuation Routes

The city is required by state law to have an emergency plan and several contingency plans in support of the basic emergency plan. A procedure for evacuating residents in case of a disaster is one such contingency plan that will be developed for disasters such as earthquakes, fires, floods, and flooding due to a dam failure.

These evacuation plans and routes are not repeated in this Safety Element even though they would be a valid part of such a plan. The duplication could cause confusion later on if modifications made to the plan were not added to both texts. Therefore the procedures and routes developed in the contingency plan for evacuation are adopted by reference as being an integral part of this Safety Element.

5. Management Program

After the priority list has been completed the management program will be initiated to accomplish the following work items:

a. Fire Prevention

1) A comprehensive management program administered by the county fire department be instituted to reduce the fire hazard.

2) Effective management of all ornamental plantings as part of the brush clearance around structures, and for plantings in public areas.

3) Take measures to reduce the threat of spreading fires wherever fire hazardous trees are planted as wind breaks.

4) All future development in the hazard zones should include vegetation replacement, fuel breaks or long term comprehensive fuel management program.

5) Provide for updating fire protection standards.

6) Help solve the incendiarism problem by improving present law enforcement and investigation equipment, adapting equipment available in other fields, and developing new equipment where needed.

7) Enlist the aid of the general public to make present laws more effective in dealing with the problem of illegal use of fire and fire-causing practices.

8) Alert the public to the potential risk for fire from any cause during critical fire weather.

9) Intensify mobile fire prevention patrols immediately before and during critical fire weather.

b. Fuel Management and Hazard Reductions

1) Encourage land management agencies to use prescribed burning techniques to selectively reduce fuel hazards consistent with management objectives and laws and with due concern for environmental quality.

2) Urge fire prevention organizations to give increased emphasis to fuel management and fuel hazard reduction.

3) Demonstrate fuel management techniques in high fire hazardous areas.

4) Strengthen research and action programs related to "fire resistent" plants.

5) Find new ways of controlling brush growth.

c. Zoning, Subdivision Codes and Land Use

1) Require the planning commission to consider land use capability in terms of fire and other natural hazards.

2) Make land developers responsible for providing a fuel management program consistent with fire protection requirements in the interim period between individual lot sales and residence construction.

d. Building Codes and Construction Material Requirements

1) Offer standards for building location and density.

2) Develop standards for hazard abatement.

3) Establish an ad hoc Building Construction Action Committee to coordinate implementation of these building code construction material requirements recommendations.

e. Fire Control

1) Develop a fire command structure for controlling fire suppression operations on conflagrations spreading through the jurisdictions of several fire protection agencies.

2) Improve firefighting communications systems to meet multi-agency needs.

3) Develop new equipment and techniques to increase the effectiveness of the individual firefighter or to replace manpower.

4) Develop and test new techniques to improve the tactical use of organized firefighting forces.

5) Provide standards for road construction in the city adequate for fire protection requirements.

6) Develop standards for water supply required for fire protection in the city.

6. Inspection Program

Building and fire safety inspection programs of buildings and premises to identify fire and other safety hazards should be formulated.

Much of the damage produced by a catastrophic event, can be avoided if care is taken, during routine fire and other building inspections, to call attention to items that could be hazardous. Many fires are caused by improper storage of chemicals and solvents. Considerable injury results from fall of unstable objects such as bookcases, filing cabinets, pictures and fluorescent light fixtures. Corrective measures are simple and cheap. A public awareness of such problems should be created by working with property owners and by appropriate publicity given to identification of such situations.

The most urgent priority in the Hazard Abatement Plan in the case of earthquakes is the inspection and evaluation by the Engineering Group of structural damage that may result from future seismic activity. After any type of disaster a priority listing should be made of structures following a critical examination to determine whether they meet community standards, whether they must be repaired, or whether they should be demolished because reconstruction cost exceeds a predetermined percentage of the value of the building.

On the same priority list, identify and cause to be removed from buildings all non-structural parts deemed to be hazardous. This includes but is not limited to features such as cornices, parapets, unsafely anchored signs, etc.

The public should have explicit notice of buildings that constitute potential seismic induced structural hazards. This could be accomplished by requiring all potentially dangerous structures to be posted with signs indicating that their safety is suspect.

Generally, existing substandard structures of all kinds constitute the greatest hazard to a community and mitigation processes as herein described should be immediately activated. There should be a continual ongoing program to reach a status of economically acceptable safety, commensurate to the degree of structural soundness the community is willing to support.

These procedures should conform with that established in the cities' adopted Emergency Plan, the county's Emergency Plan, and the cities' Seismic Safety Element.

7. Contingency Plans

Contingency plans for major disasters or emergencies have been prepared by the Office of Emergency Services in their "Kern County Emergency Plan" and by each city in their own plan. This safety element should be in conformance with these emergency plans.

The Kern County Emergency Plan and those for each of the eleven cities were developed in accordance with the California Emergency Act (Government Code, Article 10, Chapter 7, Division 1 of Title 2) and Kern County Ordinance No. A-257 of October 3, 1972, to serve as a guide for the coordination of emergency preparedness and operations, before, during, and after a nuclear attack, other types of warfare or a natural disaster.

PART TWO

BACKGROUND INFORMATION

A. SAFETY PLANNING

1. Analysis of Data

a. Safety Hazard Recognition

For within city movement to shelter, a general map of traffic plan must be worked out, directional signs and instructions printed, and the people advised as to the location of his shelter area.

If the city has more shelter space than residents and is designated in the CSP to receive additional people from nearby areas, plans for their movement and reception should also be worked out with your local civil preparedness direction.

The city's disaster planning should consider all utilities such as water, gas, steam, power, ventilation or refrigeration devices. Drawings showing the location of key valves, switches, and feed lines should be accessible during an emergency. Consideration should be given to maintaining an adequate water supply after shutdown. A survey of all water-collecting units should be made (e.g., sprinkler lines, processing water tanks, tubs used in wet-processing operations, and water being used for humidifying purposes). In many cases, such water may be used for firefighting, decontamination procedures, and general sanitation, even if it is not fit for drinking. The use of water from nearby rivers, lakes, or wells should also be considered.

b. Safety Hazard Reduction

Warning System

To carry out warning responsibilities, the federal, state, and local governments have established, and continue to maintain and operate, a nationwide warning system.

The federal portion, which serves the continental United States, is called the National Warning System (NAWAS). It operates three National Warning Centers, manned 24 hours daily by attack warning officers, and utilizes thousands of miles of private-wire telephone circuits that link the warning centers with more than 1700 warning points, extensions, and backup installations that serve all of the states and their principal political subdivisions.

The National Warning Center is located in the North American Air Defense Command (NORAD) Headquarters in Colorado Springs, Colorado, where information concerning impending attack would be made immediately available. Two alternate warning centers at Denton, Texas, and Olney, Maryland, can assume the functions of the National Warning Center if necessary.

NAWAS warning points are strategically located throughout the continental United States. Since NAWAS operates on a 24-hour-a-day schedule, NAWAS warning points must be manned continuously. For this reason, state and municipal police stations and fire stations are generally selected as warning points. In addition, operating personnel at these locations are already trained and accustomed to handling messages of an emergency nature. Most NAWAS warning points

are responsible for warning an area assigned to them by the state. In addition to the dissemination of warnings, they are responsible for providing DCPA regional headquarters or warning centers with flash information concerning nuclear detonations, initial damage estimates, fallout, downed aircraft, natural disasters, and similar incidents.

In every state, one NAWAS warning point is selected as the State Warning Point and is assigned responsibility for control of NAWAS within the state. The State Warning Point is also responsible for relaying emergency information to the appropriate DCPA regional headquarters.

Warning involves technological problems: (1) monitoring and detecting the precursor signs and signals of a developing disaster threat, (2) calculating and forecasting the time and place of the event, and (3) transmitting the warning to officials and the public. Timeliness and accuracy vary widely with different types of disasters—from virtually no practical warning capability in the case of earthquakes to rather significant capabilities in the case of floods. Whatever the state of the art, timely and accurate warning and appropriate public response are central objectives.

Intensive study has been conducted to determine what technological improvements could be applied to natural disaster warning as well as enemy attack. The study recognized the desirability of implementing a national system to give a continuous capability for direct warning of the public. To this end, a program of studies and tests will be conducted to provide such a system and to assure that the cost of home receivers is brought within reach of the general public.

Natural disaster may often overwhelm local resources but are unlikely to overtax the Nation's resources. Because of the ready availability of outside assistance in natural disasters, it is more important to plan for receiving and distributing supplies from outside than to stockpile emergency supplies within a potential disaster area. An important exception is medical supplies; their immediate availability can be crucial. Packages Disaster Hospitals, Natural Disaster Hospitals, and Hospital Reserve Inventories have been positioned throughout the county to supplement normal medical resources. Also, Office of Emergency Preparedness and the Department of Housing and Urban Development are investigating the feasibility of stockpiling emergency and temporary housing resources.

The key to effective organization for response to natural disasters or any other emergency is simply to accelerate and reinforce existing, practiced governmental functions. An emergency is not the time to introduce a new and unfamiliar apparatus for coordination and control. The public looks to established political authorities to act quickly and effectively in an emergency. The Office of Emergency Preparednedd has developed a concept for a field organization in which normal staffs are augmented by representatives of the principal federal agencies involved in disaster operations and recovery assistance. The concept is similarly applicable to state and local governments in meeting the emergencies of natural disasters.

An informed public is essential to successful disaster protection and preparedness. The public must know when and how to prepare for an imminent disaster and what to do if it occurs. Unfortunately, there are practical difficulties raised by information and warning programs. For example, it is expensive in time and money to maintain a public alert for a disaster that does not happen, and such false alerts degrade public confidence in warnings. Elements of an effective public information program can sometimes be quite simple, for example, pages in the Oahu, Hawaii telephone book giving ready reference for the tsunami (tidal wave) danger area and evacuation routes. Infrequent disasters require theoretical explanations and case histories beyond the public's experience.

On the other hand, there are natural dangers—such as flooding and hurricanes —which occur more frequently in a given area and whose approach can usually be witnessed, thereby reinforcing the urgency of the warning. For these hazards, public knowledge and alertness can be reinforced as the season approaches. Thus, public information programs, to be effective, must be conceived for each individual type of disaster and for the particular threat to the community.

Federal legislation has generally kept pace with the growing problems of disaster. This has not been the case with most state and local governments. State disaster laws have been changed in relatively few instances over the past two decades.

Most legislative effort has been directed to emergency measures in reaction to particular disasters; only recently has significant attention been given to state and local legislation intended to avoid by intelligent planning and land use or prepared for disasters. While continued attention must be given to strengthening state and local capabilities to react swiftly and effectively to disaster events, the primary thrust of legislative effort in the next few years should be aimed at enactment of land-use controls for areas particularly susceptible to disasters and enactment of building standards for structures subject to specific disaster threats.

2. Training for Emergency Management

In organizing for self-help in emergencies, it is vital that the emergency coordinator and advisory committee be thoroughly informed and trained in what to do and how to do it, in what other cities are doing, and in the community's emergency procedures.* They should be prepared for natural disasters such as tornadoes, floods, earthquakes, and blizzards; major industrial accidents such as explosions, fires, and chemical leakage; radiological incidents, sabotage, civil disturbances, bomb threats, and nuclear attack.

a. Guard and Police Service. The police chief should be familiar with all parts of the city, all known hazards, and the related self-help organization.

In case of a disaster a permanent guard force probably is assigned. The guard force might be comprised of selected civilians trained for guard duty during times of emergency.

b. Medical and Health Service. It is anticipated that a disaster could overtax the facilities normally used as hospitals, or destroy them completely. For this reason, emergency casualty stations should be preselected and facilities set up. Consideration should be given to the possible use of areas which might be suitable. At least one station should be selected in each area in the city, with alternate locations specified. Functions performed there would include screening of casualties as they are brought in (to determine priority of attention), treatment of shock, bleeding controls, relief of pain, dressing of wounds, splint application, initiation of identification and casualty records, and arrangement for transportation to other facilities.

The U. S. Public Health Service and the Defense Civil Preparedness Agency, in cooperation with the American Medical Association, have developed a "Medical Self-Help Training Program." It is designed to prepare people for survival when professional health personnel are not available. This training is a necessity for all employees assigned to a medical service. The 16-hour course is given without charge under arrangements made by the state health department and the state civil preparedness office. The local civil preparedness director can provide specific information.

The city manager should assure that in the preparation of all emergency plans adequate consideration is given to the welfare of employees and the public.

In the event of a major disaster (e.g., flood, tornado , earthquake, etc.) problems of food, drinking water, sanitation, and emergency shelter require immediate attention.

At least one individual in the city emergency control group should be made responsible for each of the following:

1. All emergency welfare services.
2. Establishing liaison with appropriate agencies (Civil Preparedness and Red Cross).
3. Utilizing facilities available for alleviating emergency hardships.

Among emergency welfare services are feeding, clothing, lodging, registration and inquiry, and financial assistance.

Because cities and their shelter facilities may have to be used as community welfare centers during major disasters, plans for industrial emergency welfare services should be coordinated with those of the community.

Training is available through civil preparedness agencies.

c. Radiological Defense Service. In the event of a nuclear disaster, trained radiological monitors would be required to detect and measure radiation. Following nuclear attack, fallout would pose the greatest radiation danger.

As a preparedness measure, radiological detection and measuring instruments have been placed in most public fallout shelters, and individuals have been trained in their use. Industrial plants should also be prepared to deal with peacetime radiological incidents. Company services should be provided by a radiation monitoring squad, operating under the direction of the Emergency Coordinator. At least one radiological monitor and alternate should be available for each shift.

The emergency coordinator should organize the squad, appoint members and leaders, assign appropriate duties, and supervise the radiological monitoring training program.

In restoring production after a nuclear incident, areas, facilities, equipment, and supplies should be checked first by the radiological monitors.

A storage place for monitoring equipment should be selected in a place least likely to be damaged or blocked by debris. Members of the monitoring squad should not be assigned to any other emergency service.

Arrangements should be worked out with your local civil preparedness agency for an exchange of radiological defense warnings and monitoring data following a radiological incident. Coordinated emergency action plans should be developed.

d. Engineering Service. An engineering service should be established to develop and maintain emergency facilities, establish and test shutdown procedures, prepare damage assessment reports, and perform postdisaster repairs and restoration.

Engineering service personnel may also be called upon to design, construct, equip, and maintain fallout shelters, a warning system, the control center, and the emergency communications system.

These facilities may have special emergency requirements for water, light, heat, ventilation, and electric power.

A secondary source of drinking water may be available in federally furnished water drums in some public fallout shelters.

e. Rescue Teams. The mission of rescue teams in a natural disaster, industrial accident, or enemy attack is to:

-locate and extricate persons trapped in damaged buildings, shelters, vehicles, and other enclosures, or from radiologically contaminated areas.
- Render essential first aid during the release of victims and their removal to the nearest safe location or aid station, or until first aid teams arrive.
-Remove bodies of victims.
-Recover critical supplies, equipment, and materials needed for survival, such as valuables, clothing, food, and medical supplies.
-Assist in making emergency repairs.
-Assist in clearing debris.

Rescue operations should be carried out in two phases:

Phase One - Removal of persons lightly trapped either on the ground or within slightly damaged structures. These removals may be effected by people with basic rescue training.

Phase Two - Removal of persons heavily trapped either on the ground or within heavily damaged structures. These rescue operations depend on the services of highly trained and equipped rescue squads.

The squad or team is the basic unit of the rescue organization. Rescue teams should be composed of 4 to 10 persons per shift, per area.

A team leader and assistant team leader should be selected. Where possible, team members should have construction and maintenance trades backgrounds. They should be physically able to endure arduous work for long periods of time. All should be trained in first aid.

Additional safety hazard reduction measures are outlined in the Seismic Safety Element of the city, the related Geologic and Earthquake Hazards, Planning Guide to the Seismic Safety Element, the Kern County Emergency Plan and the adopted Emergency Plan of the city.

f. Acceptable Level of Risk

Estimates of potential risk to specific construction projects (or seismic elements in general plans, or in environmental impact analyses) can vary more because of technological considerations. For example, industry responds to public demand for fuel or power by building a pipeline or power plant to realize a financial profit in a competitive economic system. Government on the other hand, has a responsibility to protect the public from unsafe construction, excessive environmental deterioration, and misuse of natural resources. Thus, although both industry and government want the best of everything for everybody, the weighing of advantages and disadvantages of a particular project is made on different scales. Furthermore, many other entities, such as private conservation groups, automobile clubs, and governmental agencies, have their special interests and responsibilities.

These groups may be represented by persons who, although well informed, honest, and objective, can have widely differing motives. Finally, the political or legal decisions that result may, or may not be practical, or in the best interests of the general public. Essentially, the acceptable risk is going to be a judgement decision made by the local people. The degree of risk they are willing to accept will to a large part depend on the state of economy and the cost of establishing a particular level of risk.

g. Objective to be Obtained

The Safety Element has as its objective the development of an emergency readiness program that will prepare the community to react promptly to save life and protect property if this city is threatened or hit by a major emergency or disaster of any type.

If earthquake or flood threatens, hundreds of people may need to be evacuated from low-lying areas and then fed and housed until the danger is over. A massive effort may be needed to strengthen dikes or levees when a river is rising to flood stage. If an earthquake hits, the damaged area must be combed for injured people and they must be given first aid and medical attention as promptly as possible. Also, the homeless must be fed and housed. If a plane crashes, there are usually massive problems of getting fire and medical units into the damaged area and of keeping the curious out. The same types of emergency operations, but on a far larger scale, would be required if the United States should ever suffer a nuclear attack; and there would be the added need to shelter people from radioactive fallout.

Engineering, security, fire, and health service personnel (plus doctors, and other medical professionals) are the frontline forces that take the lead in carrying out the lifesaving and property-preserving operations required by a major emergency or disaster. Oftentimes they will be reinforced and assisted by police, fire, and other emergency services from the area or neighboring communities. Volunteers will often be used; for example, persons to fill sandbags and strengthen levees or to help security and fire forces search an earthquake damaged area to rescue injured survivors.

Need for Coordination. There is one thing that distinguishes disasters or major emergencies from the emergencies city personnel deal with every day. This is the need for coordinated emergency operations. Poorly coordinated operations can lead to loss of life that might have been avoided or to needless destruction of property.

The concept of emergency readiness can be summed up by saying that the forces of government and industry must be able to "do the right things at the right time" when the chips are down. This includes those of the regular police and security forces; fire forces; ambulances; hospitals and medical personnel—and all other people and units with capabilities for helping under disaster conditions.

h. Priorities for Hazard Abatement

As a practical matter, key local government and organization executives are responsible for coordinating the emergency operations required in major emergencies.

The essential <u>first step</u> in preparing for disaster operations is establishment of an overall disaster plan, which has the approval of appropriate government officials.

The second step in preparing for a disaster is to establish an effective communitywide emergency operations capability which requires local government, local facility, and organization cooperation. The local civil preparedness director is the key to community preparedness. He must coordinate planning for use of local resources in a major emergency. His control center in emergency would be the Emergency Operating Center of local government. A similar control center should be set up in each industrial facility.

These centers should offer at least some protection from the effects of natural and other peacetime disasters, and from the effects (blast, heat, radiation) of nuclear attack. The more protection, the better. Any emergency operating center, or control center, must be a communications center, so that responsible officials gathered there can keep informed of the developing situation, and can base control decisions on factual information.

There should be good communications links from city emergency control centers to state and federal ECC's and to the control centers of ECC's with which mutual aid agreements have been reached.

The communications facilities should also enable local government officials to communicate readily with the public.

The third step is the protection of people from disaster. Protection of city facilities, equipment, and supplies is also important. Both can be essential to rapid restoration of operations after disaster. Emergency shutdown procedures may have to be effected as part of the disaster operations. These should be well-established, for implementation as necessary in specific emergencies. Damage and loss may be averted or reduced further by continuing damage assessment and control, and by emergency protection measures.

Emergency preparedness planning should include attention to the following:

- Develop a complete plan for emergency shutdown evacuation, peak load water supply and disaster control.
- Instruct and train personnel to implement the emergency shutdown procedures.
- Establish damage assessment and control techniques to minimize property loss during a disaster.

The more obvious areas to be considered in developing emergency shutdown procedures are as follows:

(1) Emergency shutdown procedures for city utility services and equipment should be developed and tested by the department managers concerned. Instructions should be prepared and posted on or near the control panels, valves, switches, and operating mechanisms of each piece of major equipment. Maintenance employees on each shift should be assigned specific responsibilities for emergency shutdown. Red emergency shutoff tags should be stored with or near each major piece of equipment for attachment at the time the shutdown procedure is to be carried out.

(2.) Provisions should be made to protect valuable and sensitive tools, instruments, machinery, and materials. Plans should be made to store precious metals, and original drawings and prints in locked storage or moved to safer locations, depending on time available and nature of the anticipated disaster.

(3.) Personnel should be designated to close doors and windows, tie down loose equipment, move equipment and supplies to shelter areas, and to barricade windows and doors. Other personnel should be assigned to stand by firefighting hoses and equipment. Assignments involving physical security of the city should cover established building zones or areas. Department heads have responsibility to complete shutdown checkoff lists and to supervise shutdown procedures in their particular areas.

(4.) Equipment and materials stored outside should be protected by banding, tiedown, moving critical or valuable items to inside storage, or moving mobile equipment to high ground or protected sides of the buildings, depending upon time available and the anticipated disaster condition.

Movement to Shelter. Movement of people to shelter in advance of a natural disaster or an enemy attack is a very important action which requires advance planning and coordination, both with city emergency organizations and with the local civil preparedness director.

3. Location and Extent of Known Hazards (Vulnerability Analysis)

a. Fire Hazards

A great number of people lose their lives in structure fires than non-structure fires because of the short warning time. Occassionally homeowners are injured or killed when they delay in leaving a burning structure (they can't be forced to leave) but in most cases it is because they were overcome without warning or else an arsonist is trapped before he can escape.

The economy can be adversely affected when buildings are destroyed by fire because they are re-assessed and the reduced income to the city reflects these losses. Public utilities are unduly taxed by fires when water demands are greater, power lines are downed, and telephone systems disrupted.

The County and city fire departments monitor the fire hazards in their areas. They have an ongoing program for inventorying and alleviating hazardous situations. Hazardous areas should be shown on a city map and a program for the abatement commenced.

The city is vulnerable to fire hazards from within their boundary as well as from those at their periphery. From within the city can control variance codes that effect major hazard mainly from burning structures. Peripheral hazards, not easily regulated by the city, may include burning structures in addition to shrubbery and grass in open fields and forests.

Fire protection districts within Kern County are: [Function performed: (1) Fire Protection (Hydrant), and (2) None]

Arvin Fire Protection District (2)
Ford City Fire Protection District (1)
Inyokern Fire Protection District (1)
La Cresta Fire Protection District (1)
Mojave Fire Protection District (1)
Oildale Fire Protection District (2)
Rosamond Fire Protection District (1)
South Taft Fire Protection District (1)
Virginia Colony Fire Protection District (1)

b. Geology Hazards

General Description of Fault Displacement Hazards. The earth is laced with fault—planes or surfaces in earth materials along which failure has occurred and materials on opposite sides have moved relative to one another in response to the accumulation of stress. Most of these faults have not moved for hundreds of thousands or even millions of years and thus can be considered inactive. Others, however, show evidence of current activity or have moved sufficiently recently to be considered active, i.e., capable of displacement in the near future. Any fault movement beneath a building in excess of an inch or two could have catastrophic effects on the structure, depending upon its design and construction, and the shaking stresses it experiences at the same time. Therefore, it is important to know not only which faults may move but how they might move.

The definition of what constitutes an "active fault" may vary greatly according to the type of land use contemplated or to the importance of the structure. For example, the Atomic Energy Commission regards a fault as active or "capable" with respect to nuclear reactor sites if it has moved "at or near the ground surface at least once in the past 500,000 years" (Atomic Energy Commission, 1971). Commonly, faults are regarded as active and of concern to land-use planning when there is evidence they they have moved during historic time or, through geologic evidence there may be a significant likelihood that they will move during the projected use of a particular structure or piece of land. Because geologic evidence may be lacking, obscure, or ambiguous as to specific times of past movement, geologists may be able to estimate relative degree of activity only after a regional analysis that may extend far beyond the locality under consideration. Such analysis may be based on historic evidence of fault movement, seismic activity (occurrence of small to moderate earthquakes along the fault trace even though not accompanied by obvious fault movement), displacement of recent earth layers (those deposited during the past 10,000 years), and presence of topographically young fault-produced features (scarps, sag ponds, offset stream courses and disruption of man-made features such as fences, curbs, etc.). Movement, however, seldom is limited to a single fault surface throughout the lifetime of a fault system. Faults that commonly produce significant displacement (more than several inches at a time) often have related branches that diverge from the main fault but usually have less movement along them. They may also have secondary faults that are not directly or obviously connected physically to the main fault trace. Secondary faults are usually nearby (within hundreds of feet of the main rupture) but they may extend as much as several miles away. As with branch faults, displacement along secondary faults is usually only a fraction of that along a main fault.

The amount of displacement that can occur during a single earthquake can be related in a general way to the total length of a fault. However, in addition to the location and amount of displacement, the sense of movement is extremely important in estimating the amount and type of damage that might be produced. This was evidenced by the great damage over faults during the moderate (magnitude 6.6) San Fernando Earthquake, which produced a reverse or thrust fault movement. (See Figure 1a). Movement occurred along a similar plane, but in an opposite direction on the normal Wasatch Fault in Utah. (See Figure 1b). Left-lateral movement (Figure 1c) and right-lateral movement, which is common to the San Andreas Fault, probably are less potentially damaging to most structures than normal or thrust faulting.

Not all surface faulting need be rapid nor need it occur during major earthquakes. Imperceptibly slow movement, called "fault creep," occurs along the Hayward, Calaveras, and some other faults, and may be accompanied by micro-earthquakes. Similarly, not all deformation of the earth's surface produces fault displacements. Strains in the earth deform the rocks until their strength is exceeded and they rupture, producing the earthquake. Accompanying this bending, however, is a certain amount of plastic deformation. Both rupture and plastic deformation commonly occur along active fault zones and may be sufficient to damage or destroy structures over particularly strongly deformed rocks. Earthquakes deep within the earth may result from rupture of deeply buried rocks but without fault displacement at the ground surface, although the surface rocks may be deformed (see Figure 1d). This may have been the case along a part of the Newport-Inglewood Fault zone where movement along the fault during the last 10,000 years or so has merely caused a permanent flexuring or bending of the surface rocks.

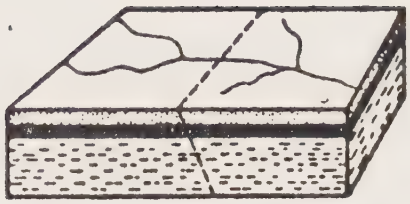
For planning purposes there are two kinds of faults: (1) active faults which have experienced displacement in recent geologic time, suggesting that future displacement can be expected on these faults; and (2) inactive faults that have shown no evidence of movement in recent geologic time, suggesting that these faults are dormant. However, some faults labeled as inactive are so termed due to lack of knowledge. Increased research and monitoring of these faults could reveal some of them as active.

The State Division of Mines and Geology ("Urban Geology" 1973, Bull. 199) indicates that on a state-wide basis the potential hazard to structures from the surface displacement of faults is low compared to such geologic phenomena as earthquake shaking and landsliding. Historically, major losses due to fault displacement have been limited to the San Fernando Earthquake of 1971. Structural losses due to fault displacement in the 26 other major earthquakes in California are unknown but were probably small. Most of the losses incurred during the 1906 San Francisco Earthquake and 1952 Tehachapi Earthquake were cased by earthquake shaking and ensuing fires.

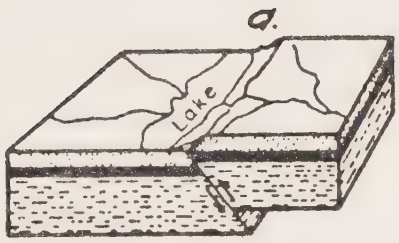
Many geologic hazard areas have been recognized and mapped; they are shown on maps that comprise the Seismic Hazard Atlas for the entire Kern County area. Included on these maps are identifiable hazard areas such as:

-Zones of active faulting

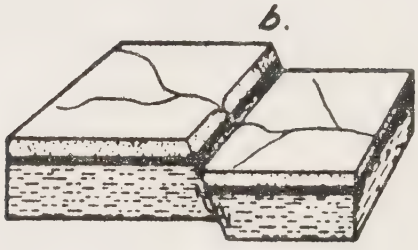
-Landslide areas - slope stability



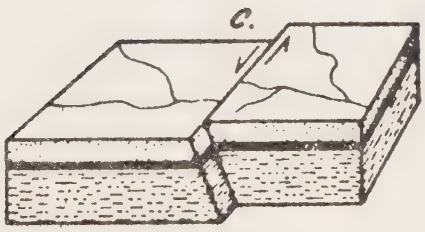
Earth block before movement



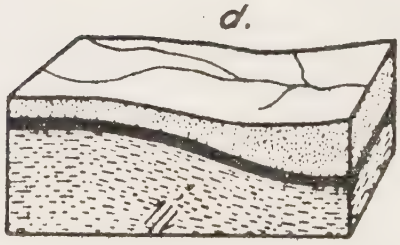
Thrust or Reverse fault



Normal fault



Left lateral fault



Monoclinal fold caused by faulting at depth

FIGURE 1. EXAMPLES OF SOME TYPES OF FAULT DISPLACEMENT AND EARTH FLEXURE

-Areas subject to liquefaction

-Shallow water table areas

-Expansive clay soil areas

-Surface material, crystallin, older and younger sediments

-Subsidence areas

Over the years much damage has been done to man's developments by earthquake shaking, landslides, liquefaction, fault displacement, etc. Much damage could have been avoided by identifying the hazardous areas and limiting development from those areas that display the most severe risk or by designing structures to withstand the hazard by applying standards which are in excess of the present uniform building code.

Sufficient knowledge is now becoming available to enable planners to determine which areas should be avoided. In most instances we can also identify areas which will require special care in design. Such identification should be made to assist the developer design structures which will withstand shaking produced shock waves and trigger mechanisms that produce ground failure such as landslides, liquefaction, subsidence and fractures.

These issues are considered in the Seismic Safety Element of the cities' general plans.

Emergency Measures. Earthquake emergency plans, the subject of this element, are those of a temporary nature. These are considered an emergency measure when warning is received of geologic disaster caused by the earthquake shock-wave.

A comprehensive study of the geologic hazards is presented in the cities' adopted Seismic Safety Element of the General Plan. This element should be consulted if additional detail is needed. Quadrangle maps that show the geology of this area are a part of the SSE and copies can be obtained from the city.

ARVIN

a. Ground Shaking

The city is in an area of the San Joaquin Valley subject to moderate to severe ground shaking. This hazard is produced by the buildup of potential energy along major fault systems that may suddenly be released.

Of the 6,700± foot thickness of sedimentary cover over the crystalline basement complex, approximately 1,900 feet is composed of younger sediment. This condition is conducive to the propagation of elastic seismic waves.

A program should be initiated to inventory and systematically eliminate existing structural hazards that could endanger people's lives and property in the event of an earthquake.

New construction proposals should be reviewed by the Building Inspection Department to determine if the minimum requirements of the Uniform Building Code are adequate for each particular site. Construction plans other than single family dwellings should be subjected to additional studies.

Because it is difficult to predict strong motion characteristics and their effect quantatively, high-rise structures that have a long fundamental period equivalent to that of the ground response should be analyzed by structural engineers.

Underground utilities, roads, and concrete lined canals are vulnerable to ground shaking. Consideration should be given to their design and construction in order to provide uninterrupted service.

b. Ground Failure

- Landslides

The land within the city boundary is situated on a gentle southwest slope of the valley, not subject to significant landslides or soil creep.

- Flooding Induced by Seismic Activity

This hazard appears to be minimal from causes within the city, however, flooding within the city caused from conditions outside the city is possible. The damming by landslides of intermittent streams in the adjacent mountains and subsequent failure of the dam is a significant hazard.

A flood plain management program should be initiated in cooperation with the county to mitigate this hazard.

- Land Subsidence

This type of ground failure can be triggered by ground shaking; it can also be a condition related to normal differential compaction of unconsolidated sediments, it can be caused by the addition of water to certain soil types (hydrocompaction), or it can be caused by withdrawal of large volumes of fluid, either water or oil. Arvin has experienced some subsidence, approximately 1 to 2 feet in the past forty years (Map No. 4 of the Seismic Safety Atlas). This slow rate of subsidence may continue as oil and water are withdrawn from the underground reservoirs. Water recharge may slow or halt this subsidence. At present the center of subsiding area 12 miles to the southwest of Arvin has experienced 7 feet of subsidence since 1926. Subsidence may cause some maintenance problems of roads and underground facilities in the city. New installations of underground facilities should be engineered to withstand the continuation of subsidence.

- Clay Soil

No significant amount of clay soil, which expands when wet, thereby imparing the foundations of large structures, is recognized in this area.

- Liquefaction

Liquefaction does not appear to be a significant hazard at Arvin. No shallow perched water table is recognized; The water table is at a depth of approximately 210 feet.

- Erosion

Soil erosion, a geologic hazard that can be aggravated by ground shaking and offset along a rupture, does not appear to be a significant factor in the city of Arvin.

c. Surface Fault Rupture

No active faults (i.e. fault having displaced quaternary rock of the Holacene Epoch) are recognized in the city boundaries.

The White Wolf and Edison faults near Arvin are recognized as being active faults in the vicinity. Two faults, Tejon Thrust and Jewett Canyon Fault, within the city were interpreted from subsurface data. There is no indication of recent movement along either fracture, so they are not considered as being hazardous at this time.

c. Flooding

The flooding of land adjacent to the normal course of a drainage channel has been a natural occurrence since the first rain. What makes this process disasterous is man's occupancy of the flood plain. The economical attractiveness of the level, fertile land of the flood plain encourage development of flood-prone areas despite the potential for disaster. As these lands have been developed, the public demand for protection from economical losses caused by the inevitable flood has grown.

The steady increase in annual flood losses has been attributed to expanded development in flood-prone areas. There is, moreover, considerable evidence that new protective works, while providing protection from floods normally expected, actually encourages this expansion and increases the potential for loss from the occasional flood that exceeds the design criteria of the flood-plain area developed.

Flood control measures are included in the Conservation Element of the cities' general plan under the title of Hydrolic Forces of Water. Included are those measures of a permanent nature, deliberately planned and executed over a period of time. They are based on the expectancy of floods of various magnitudes. These measures include land treatment in water sheds and abatement of water runoff; engineering works such as dams and reservoirs to regulate the river flow and levees, channel treatment floodway management to keep flood water out of specific areas; and finally, regulations for land use to insure the most economical use of the flood plain, considering the hazard involved.

Levees allow communities to exist in what would otherwise be bottomland subjected to periodic inundation. To protect the citizens' investment and lives an effective levee system must be maintained. At the same time, the city must exercise its civic responsibility by protecting its citizens from unwise use of the flood-plain outside the levee system.

The city can insert a map in this space showing areas of flooding. Kern COG will at the request of the city draw finished maps from the city's work maps. Information available from:

Corps of Engineers
City Records
County Public Works
County Planning

(THESE MAPS WILL BE INCLUDED AS PART OF THE IMPLEMENTATION PROCEDURE.)

LEVEE DISTRICTS

General Summary

Because a breach in a levee could create a devastating flood condition that spreads over a large area they are considered in this disaster element.

The Kern River Levee District is formed under the provisions of Statutes 1907, Chapter 270, Water-Uncodified Acts, Act 4284.

(NOTE: The Levee District Law of 1959, Water Code Sections 70000 and following, does not supercede Statute 1907, Chapter 270. Each Statute is separate and distinct from the other even though both provide for the formation of levee districts.)

The district is governed by a board of trustees of three members. Each trustee must be the owner of land within the district and is elected by the voters of the district.

The district is a "land-owner voter district." A "qualified elector" is an owner of land within the district whose name appears upon the "last preceding assessment role of the county."

In addition to its general powers a levee district formed under the provisions of Statutes 1907, Chapter 270, has the following specific powers provided by statute: (Numerical references are to sections of Uncodified Act 4284)

> Acquire, construct, maintain and operate levees, dikes, drains, embankments and all other works requisite and necessary for the purpose of protecting the lands within the district from the overflow of any river, stream or watercourse. (1; 8)
>
> Cause to be levied and collected an ad valorem tax sufficient to raise revenue to pay for the construction and maintenance and operation of the works of the district. (8; 10)

There is only one Levee District in Kern County, viz:

STREET ADDRESS: 4705 Allen Road, Bakersfield, CA

MAILING ADDRESS: P. O. Box 1272, Bakersfield, CA 93302

TELEPHONE: (805) 589-2744

DATE OF FORMATION: May 1928

NUMBER OF MEMBERS GOVERNING BODY: Three (3)

FUNCTIONS ACTUALLY PERFORMED: Maintenance of levees within district. Rodent control. Keep river channel clear of vegetative growth and debris which would affect flow in channel. Deposit suitable rip rapping material on inside of fare of levees to minimize erosion. Maintain fencing of levee system to restrict access of public with vehicles.

METHOD OF FINANCING: Ad valorem taxation.

4. Use and Limitations of this Element

This report, and the accompanying maps and data, should be used only with an understanding of the intended scope and limitations of the study. The results of the study provide knowledge on the type, location and extent of hazardous fire and geologic conditions and permit comparisons of alternative land uses over large areas. However, this information alone is inadequate for specific site evaluations such as: an individual dwelling, subdivision development, road alignment, large buildings or dam. In the evaluation of these sites, detailed geologic mapping, subsurface exploration by drilling and tranching, soil sampling and laboratory testing of water supply may be required.

5. Citizens Participation

The SE informs the public regarding specific local geologic and fire hazards. It identifies means available to reduce risk and damage. Through disaster preparedness plans, it enables the public to respond to emergencies. Public participation is necessary during formulation of the plan to help decision makers determine the most acceptable policies regarding risks in relation to classes of land use.

As an essential part of the planning process, citizen participation must be included at an early stage in the program development. The purpose is to obtain their ideas in developing basic community goals and objectives (Section 65304, Gov. Code). When alternative planning concepts have been developed, there should be public review of the options through public conferences or other appropriate forums. The possible impact of each option needs to be carefully examined. Prior to official public hearings, there need to be meetings with the public to explain the content of a proposed plan to enable the public to come to hearings with better knowledge of the plan and its contents. The press should be informed about the content of a proposed plan and the status of the planning program. Finally, published materials on the general plan should be distributed as widely as possible before public meetings or public hearings are held.

Successful citizen participation will generate support for implementation of public plans and policies after official adoption. Technical committees composed of interested people and experts can also be utilized where a community is faced with particular complex problems.

The crucial part of a meaningful safety element of any general plan is the interaction of the citizens and government. In the Citizens Advisory Committee meetings and the workshop sessions of public conference, many comments, criticisms, and recommendations concerning government can be discussed, noted and recorded. These comments are significant in that they come from people relatively active in local government. They give one an insight into the general opinion that residents have of their city, its government, and the problems it faces.

The general public, represented by a citizens advisory committee, have stated that one barrier to establishing an effective safety policy is the lack of recognition among the citizenry of the potential advantages of a safety system. There is also a lack of agreement as to what constitutes a balanced system. The answer lies in increased communication to disseminate this information which is then to be used as the background for decision making.

6. Operational Area of the Emergency Plan

Operational Areas, unlike counties and cities, are not jurisdictions. They are special purpose organizations created to perform extraordinary functions for both city and county governments within a county area.

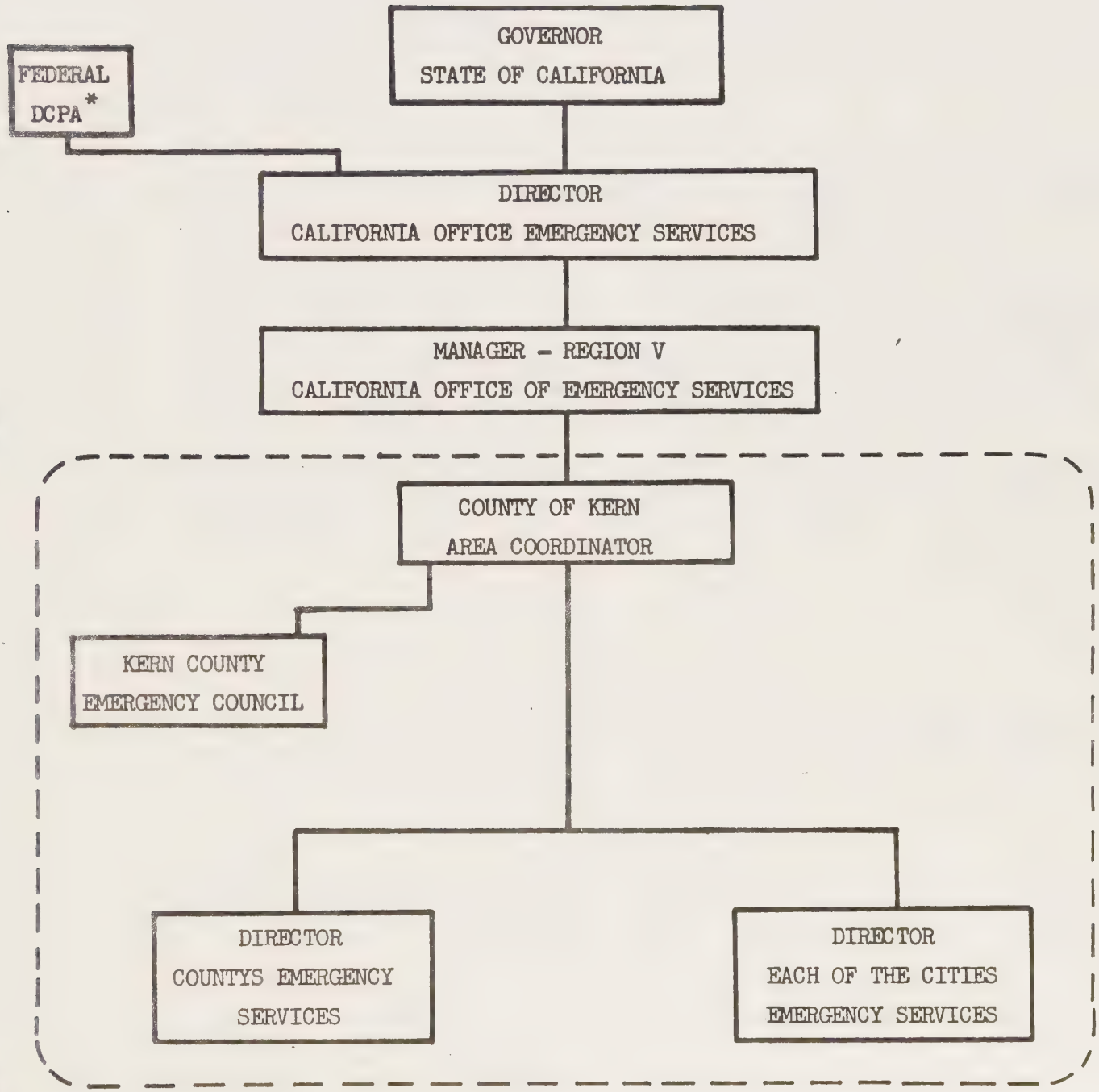
They are formed for the sole purpose of coordinating interjurisdictional emergency operations and mutual aid, and to serve as a link in the channel of communications and coordination between the state regions and local governments having no resources of its own not already associated with the jurisdictions of which it is an extension. The County of Kern Operational Area is intended to be staffed with coordinators to expeditiously harmonize interjurisdictional operations.

The County of Kern Operational Area augments, but does not replace, its member jurisdictions. It is intrinsic to the concept that each legal jurisdiction whether county or city be covered by an emergency plan for the direction and control of its own resources, and the protection of the lives and property of its citizens during a disaster. Each jurisdiction provides such services via their Director of Emergency Services and various service chiefs delineated in their Emergency Plans.

Operational Areas require plans of a different design than those of a local jurisdiction. The Operational Area Plan provides the basis for coordinating the interjurisdictional operations of the respective member jurisdictions, including provision of both inter- and intra-area mutual aid. It does not usually encompass direction and control of services or application of available resources, since these are the right and responsibility of the member jurisdictions.

County of Kern Operational Areas' coordination role serves to maximize the jurisdictional efforts and effectiveness, and this plan concerns itself exclusively with the operational role of the Operational Area rather than with pre-emergency provisions of administrative services.

OPERATIONAL AREA ORGANIZATION
MUTUAL AID COMMUNICATION CHANNELS



* DCPA - Defense Civil Preparedness Agency

B. PLAN FORMULATION

1. Introduction

Disaster protection begins with recognition and understanding of the kinds of natural disaster likely in a given area and the vulnerability of the area to those disasters. Based on this understanding, all levels of government can establish objectives for achieving protection against the threats. It is essential that the disaster preparedness programs be a cooperative and concerted effort involving federal, state and local government. Such a cooperative effort is being undertaken by the cities and the county under the guidance of the Superintendent of Emergency Services in the County's General Services Department. It requires the application of science and technology, development of plans and organizations, allocation of resources, and education of the public.

Timely and accurate warning is a major factor in the protection of life and property in natural disasters. As the following sections show, the nature of the disaster and the timeliness of warning are basic considerations in the development of an effective disaster preparedness program.

The greatest need for technical assistance is at the local level, and several federal efforts are aiding in this regard. The Corps of Engineers, for example, can be helpful to local communities with regard to flood preparedness. More recently, the Office of Emergency Preparedness has given an assignment to the Office of Civil Defense in the Department of the Army to assist in the development of local disaster preparedness.

To be confident that disaster planning is preparing government officials, volunteers, and the public to cope better with disasters, such plans must be exercised constantly and evaluated periodically.

2. Identifying Hazards

While the state law only requires that fire and geologic hazards be considered, many other hazards exist. Some of the more significant ones are listed along with those required so the scope of the safety problem is kept in mind.

a. Natural Disasters

The likelihood that the kinds of natural disasters cited in this chapter would ever strike a community may be very small; but you should plan to deal with all of the following:

Fire	Winter Storms
Floods	Earthquakes

Fires. Any small fire, if not quickly detected and suppressed, can get out of control. An uncontrolled fire is one of the most destructive forces caused by nature or by man. It is a multiple killer of people, livestock, fish, and wildlife. It can destroy property, timber, forage, watersheds, recreational facilities, and scenic values. Severe soil erosion, silting of stream beds and reservoirs, and flooding often are the legacy of uncontrolled fire.

Responsibility for fire protection on federal lands is centered primarily in the Department of Agriculture, the Department of Interior, and to a lesser degree in such agencies as the Department of Defense. The states and local agencies have recognized their responsibilities. On state and private forest lands numerous laws have been passed that have set up state forest agencies to protect these resources. In many instances, private interests have established their own fire control organizations. As the protection of natural resources often transcends property and state and local lines, strong ties of coordination and cooperation have developed among private, local, state, and federal agencies.

In addition to training and equipping their own fire department personnel for brush and other firefighting, cities near hazard areas should consider such activities as fire prevention programs, obtaining fire weather forecasts from the National Weather Service, and development of mutual-aid compacts with other cities, adjacent areas, and private agencies. Employees can be trained and equipped to fight fires without much cost in time and money. Fire departments can provide the nucleus of a force that can prevent, detect, or suppress fires before they reach the disaster stage.

Floods. Except in the case of flash flooding or dam failure the onset of most floods is a relatively slow process—with adequate warning. The buildup usually takes several days. Progressive situation reports are available from NOAA, the National Oceanic and Atmospheric Administration, through its Weather Service River Forecast Centers and River District Offices.

Flash floods and dam failure warnings are the most urgent type of flood warnings issued. These are transmitted to the public over radio and television. They should be transmitted also through local warning systems, by means of sirens, horns, or whistles; through telephone alerts; or by means of police cars using loudspeakers.

In a community having a history of recurring floods, the community's minimum requirement is to establish continuing communication with the National Weather Service. For example, flood forecasts and warnings should be telephoned to the local police headquarters, or some other centralized facility, at agreed-upon periods. During the flood-control planning phase, communities should coordinate closely with the nearest office of the U. S. Army Corps of Engineers, in accordance with established state procedures. Also, the Corps

of Engineers can provide preventive assistance for flood control as authorized under Public Law 99.

Winter Storms. Winter storms vary in size and intensity. A storm may affect only part of a state or many states, and may be a minor ice storm or a full-blown blizzard.

Prestorm-Season Preparations -

1. Organize mobile emergency rescue and medical teams, if these would be useful in your area.
2. Contact your local government or the National Weather Service and learn winter storm warnings that pertain to your area.
3. Publish winter storm safety rules in the newspaper.
4. To determine their capability to assist under varying winter storm situations, and to what extent, contact other cities, and—through your local civil preparedness agency—military units and installations, Civil Air Patrol units (CAP), amatuer radio operators and organizations (e.g., RACES), and private organizations and associations.
5. Determine location and amounts of snow fencing available, and of sand and salt. Obtain and position supplies as required.
6. Designate snow emergency routes and place identifying signs within the yard areas of the plant.
7. Establish a system for "employee-stay-home" announcements.

Earthquakes. Earthquakes are unpredictable and strike without warning. They may range in intensity from slight tremors to great shocks; and may last from a few seconds to as much as 5 minutes. They could come in a series over a period of several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Most casualties result from falling materials. Quakes can disrupt power and telephone lines, and gas, sewer, or water mains. They may also trigger landslides and generate tidal waves.

During the shaking employees should be warned to (1) stay indoors if already there; (2) take cover under sturdy furniture such as work tables; (3) stay near the center of the building; (4) stay away from glass windows and doors; and (5) not run through or near buildings where there is danger of falling debris. If people are outside, they should stay in the open, away from buildings and utility wires. After the shaking people should stay out of damaged buildings; the aftershock can shake them down. Local officials should check utilities. If water pipes are damaged or electrical wires are shorting, they should be turned off at the primary control point. If gas leakage is detected, the main valve should be shut off, windows opened and the building cleared until utility officials say it is safe.

b. Man-Made Disasters

All progressive employers and employees think in terms of on-the-job safety, and most administrators have taken steps to assure some degree of security. However, a foolproof system of safety and security has yet to be devised. It is the responsibility of management to plan for possible breakdowns in their systems.

Potential disasters caused by man should be included when developing your community emergency plan. The following are discussed in this chapter:

1. Fires
2. Chemical Accidents
3. Transportation Accidents
4. Public Demonstrations/Civil Disturbances
5. Bomb Threats
6. Sabotage
7. Radiological Accidents
8. Nuclear Attack

Fires. The most important aspect of plans for coping with major fires is development of mutual assistance agreements with local governments, and nearby federal installations. Fire control methods and techniques vary widely in different parts of the country, as well as between the various fire protection agencies. It is difficult to prescribe standard procedures. Fire organizations generally develop plans and procedures over the years to meet various fire hazards.

Smaller communities usually cannot afford to maintain the standing forces required to meet a major fire situation, so they rely on other local government services and mutual aid. To be effective in cases of large fires, industrial explosions, and forest fires, mutual aid requires good communications, accessibility to the fire scene, prearrangements for use of apparatus and manpower, and centralized command.

The single biggest need usually is not manpower and equipment. Most often it is the ability to respond quickly and to confine the fire to manageable limits before it reaches the disaster stage. This calls for a prefire plan of action for mutual aid response by existing local fire organizations. Where such plans exist at the time of a large fire, the emergency usually is manageable, with life and property loss held to a minimum.

Chemical Accidents. Several thousand chemicals in daily use can cause an emergency which would effect a substantial number of people and others in the neighborhood. These effects could include massive contamination of a community, explosions, and fires. The U. S. Department of Transportation is responsible for regulating the movement of hazardous chemcicals; and hazardous chemicals being transported interstate must be labeled with appropriate words of identification and caution.

The public should be extremely careful in the use of hazardous chemicals in all processes and productions, and should be aware of their use in neighboring plants. Care should be taken to post throughout the plant the location, hazardous properties, and characteristics of individual chemicals, and their potential hazardous reactions to each other.

City emergency coordinators and safety personnel should be familiar with the following sources of technical information on chemical hazards:

National Fire Protection Association
60 Batterymarch Street
Boston, MA 02110

Publications:

No. 49 - Hazardous Chemicals Data
No. 325 - Properties of Flammable Liquids, Gases and Volatile Solids
No. 491 - Manual of Hazardous Chemical Reactions
No. 704M - Fire Hazards of Materials

Manufacturing Chemists Association
1825 Connecticut Ave., NW
Washington, D.C. 20009

Chemical Safety Data Sheets:

Transportation Emergency Information "Chem-Cards"
(These cover specific chemicals moved in tank motor vehicles which possess flammable, oxidizing, corrosive, poisonous, and other hazardous properties.)
Marine Emergency "Cargo Information Cards"
(These are carried in the pilot house of a vessel towing tank barges, and on the barges. The information of these cards includes the hazards of chemicals and recommendations on handling fires, chemical leaks, and human exposure threats.)

National Agricultural Chemists Association
1155 - 15th St., NW
Washington, D.C. 20005

(Members of this Association have a network of more than 40 safety teams nationwide prepared for prompt cleanup and decontamination of poison pesticides involved in a major accident.)

Association of American Railroads
Bureau of Explosives
1920 L St., NW
Washington, D.C. 20036

Publications:

B.E. Pamphlet No. 8A, Dangerous Articles Emergency Guide
B.E. Pamphlet No. 22, Handling Collisions and Derailments Involving Explosives, Gasoline, and other Dangerous Articles
B.E. Pamphlet No. 29, Procedures for Handling Special Atomic Energy Commission Shipments

Transportation Accidents. Almost every city is exposed daily to the possibility of air, automobile, railroad, or shipping accidents in or near its boundaries. Officials should be prepared to handle the type of problems they will have to face if a plant in their vicinity has a major transportation accident.

Since not all cities have the same exposure nor the same resources to handle such emergencies, it is recommended that the city develop its own plan of action—including agreements on giving and receiving aid. Local plans should include listings of the type of equipment or services needed, the source and location of the equipment or services, the person or point to contact to give or obtain immediate response to an emergency request, and the means and methods of compensating (if appropriate) for the use of the equipment or services in an emergency.

Major transportation accidents often cause chemical spills, fires, explosions, and other results, which call for special operations, such as rescue and evacuation. Usually, transportation accidents effect only relatively small areas and involve only a small number of people.

An airplane crash may create the need for firefighting and other operations in the area of impact.

An automobile crash involving buses or carriers of hazardous cargoes can involve substantial rescue, firefighting and evacuation operations.

A railroad accident can produce hazardous situations when it occurs in or near cities—particularly if the cargo is flammable or explosive. This can also involve substantial rescue, firefighting, and evacuation operations.

Regardless of the type of transportation accident, the first consideration should be to save lives. This can be accomplished through quick response and coordination of the city emergency services with local police, fire, and medical services.

When a transportation accident involves chemicals or other hazardous materials, the appropriate plant Emergency Services Action Checklist should also be used (e.g., "Chemical Accidents," "Radiological Accidents").

c. Public Demonstration/Civil Disturbances

Recent years have seen a variety of demonstrations for different purposes in many locations throughout the county. Some demonstrations develop slowly, allowing the authorities to assess the problem, and to conduct negotiations with the organizers and arrange for control measures. On other occasions, violence may flare up with little advance notice. But even these incidents usually are preceded by earlier indications of a buildup of tensions and pressures.

In a situation which is developing slowly and deliberately, city officials may operate during the preliminary or negotiating phase out of their regular offices, calling staff directors as required, and routinely circulating information to departments concerned.

In a situation where there is a sudden eruption of violence, accompanied perhaps by attempted arson and assaults, security personnel usually will be involved initially and will serve as the source for information regarding the characteristics and extent of the disturbance. Their intelligence-gathering capability, coupled with that of local sheriff's agencies, generally will provide the information needed to make appropriate decisions.

Bomb Threats. Compared with other city emergencies, the covert and criminal nature of bombing incidents make bomb threats a highly complex problem for city management and emergency service personnel. Consequently, prior planning to meet the threat should include contact with a nearby military Explosive Ordnance Disposal Detachment, and with a local or neighboring sheriff's department—particularly if it has a bomb disposal unit. Arrange to obtain the assistance of experienced personnel.

Since there may be some question in regard to the participation of non-city manpower in handling dangerous explosive materials which are the responsibility of city officials, consideration must be given in advance to "going it alone" if necessary. Therefore, training programs for city specialists in handling improvised explosive devices should be utilized when they are available through Military Explosive Ordnance Disposal Control Center, and/or Law Enforcement Assistance Administration (LEAA) programs.

Experience shows that over 95 per cent of all written or telephoned bomb threats are hoaxes. However, there is always a chance that a threat may be authentic. Appropriate action should be taken in each case to provide for the safety of employees, the public, and property; and to locate the suspected explosive or incendiary device so it can be neutralized.

While the responsibility for action rests primarily with the police department, this will be affected to some degree by other persons involved. For example, the city manager must make the decision whether or not to evacuate the building after a bomb threat has been received, and where to send the people who are evacuated. Also, whether or not people who work in the threatened building, and who know what does or doesn't belong in or near the building, should conduct the search for a suspected bomb.

If the object is located and thought to be a bomb, and the local police cannot dispose of it, the services of a bomb disposal unit previously arranged for should be requested.

Sabotage. No city is immune to sabotage. However, the types of targets for sabotage usually can be predicted with reasonable accuracy. The saboteur will generally look for a target that is critical, vulnerable, accessible, and at least partially conducive to self-destruction. Saboteurs are generally enemy agents, disgruntled employees who commit sabotage for revenge, or individuals who are mentally ill or have been duped by enemy propaganda.

The methods of sabotage may be classified as follows:

1. Chemical - the addition or insertion of destructive or polluting chemicals.
2. Electric or electronic - interrupting or interfering with electrical or electronic processes or power, and jamming communications.
3. Explosive- detonating explosive materials, or damaging or destroying by explosives.
4. Incendiary devices - ignited by chemicals, electrical or electronic or mechanical means, or any ordinary means of arson.
5. Mechanical - breaking or omitting parts, using improper or inferior parts, or failing to lubricate or maintain properly.
6. Psychological- inciting strikes, boycotts, unrest, personal animosities; or causing slow downs, or work stoppage by excessive spoilage or inferior work.

The prevention of sabotage may be accomplished by reducing target accessibility and vulnerability. This may be done by allowing only authorized access to the potential target; screening and placing employees in accordance with security requirements; designing, constructing, and modifying equipment with built-in protection against sabotage; conducting continuing education of employees on prevention of sabotage; and having a plan with organization and procedures for handling potential or actual sabotage.

Radiological Accidents. The widespread and rapidly increasing industrial and commercial use and transportation of radioactive materials has increased the possibility of radiological hazards resulting from accidents involving these materials. Accidents may occur in facilities where radioactive materials are used or processed, or during transportation.

In the event that city and local emergency services are not adequate to cope with the situation, federal assistance can be requested by calling an Atomic Energy Commission (AEC) office or a military service installation. In accordance with an Interagency Radiological Assistance Plan, the radiological emergency response capabilities of federal agencies can be used to protect the public health and safety, or to assist organizations or individuals needing immediate radiological emergency assistance.

Coordinated by the AEC, men and equipment are available around-the-clock, to assist on request at the scene of all kinds of radiological incidents believed to require capabilities beyond those available locally.

Special emergency response capabilities have been established by the AEC and Department of Defense for coping with accidents involving nuclear weapons and so-called peaceful nuclear explosives.

When a radiological incident occurs in a city, some degree of immediate response by state and local public safety personnel usually will be required. Initial action may be by local fire or police personnel first at the scene of the incident.

Nuclear Attack. The blast and heat effects of nuclear weapons, while similar in nature to conventional weapons, are enormously greater in power, and pose the added threat of radioactivity. The effects of nuclear weapons differ from those of conventional weapons in the following principal ways:

1. Nuclear explosions may be many thousands (or millions) of times more powerful than the largest conventional detonations. An experimental nuclear device exploded at Amchitka in the Aleutian Islandsin November, 1971, had an estimated yield of more than 5 megatons (MT), which means it released more energy than the explosion of 5 million tons of TNT. Larger devices have also been tested by several nations.

2. A fairly large proportion of the energy in a nuclear explosion is emitted in the form of light and heat, generally referred to as "thermal radiation." This is capable of causing skin burns and of starting fires at considerable distances. The nuclear explosion also releases a burst of highly penetrating and harmful invisible rays called "initial nuclear radiation." The initial radiation effect is overshadowed by blast and fire effects which can cause almost total destruction within a radius considerably larger than that affected by initial nuclear radiation.

3. A nuclear detonation also produces an electromagnetic pulse (EMP), sometimes called "radioflash," which, under proper conditions, can affect large areas. The bulk of EMP energy lies within the radio frequency spectrum (ranging from powerline frequencies to radar system frequencies). EMP is electrical in nature and is crudely similar to the waves radiated by local lightening or a broadcast station. This pulse is easily picked up by any conductive material, damaging any electrical or electronic equipment connected to this material.

4. If a nuclear explosion occurs at or near the ground, great quantities of radioactive earth and other materials are drawn upward to high altitudes. The radioactive particles can fall back to earth over a period of several hours, over a wide area. This phenomenon is known as "fallout," and particles emit what is called "residual nuclear radiation."

Figure 1 shows the distribution of energy in the explosion of a typical nuclear weapon.

Figure 2 shows the effects of 5 and 25 megaton surface nuclear blasts, respectively.

Figure 3 shows sample radioactive fallout patterns.

Radioactive Fallout. Fallout particles emit principally alpha, beta, and gamma radiation. Gamma radiation is the one which most concerns civil preparedness planners, as it cannot be detected by any of the human senses; and is highly penetrating, and harmful to living cells. Gamma radiation can be detected and measured only with special instruments. It is measured in units called Roentgens (R).

For exposed persons, a dose of more than 200 R over a short period of time could cause disabling illness and some deaths. At 450 R, there would be a 50-50 probability of death; and few persons would survive a dose of more than 600 R.

In a nuclear air burst (one in which the fireball does not touch the ground), debris is not present to lend weight to the radioactive particles produced, so they stay aloft for a long period of time. As they eventually return to earth, their radioactivity will have diminished to a harmless level.

In an all-out nuclear attack against the U.S. military, industrial, and population centers, severe to moderate damage from the blast and heat effects would occur in about 2 per cent of the Nation's area. In addition, radioactive fallout could be expected to spread over about 75 per cent of the land area of the United States, in varying intensities, contaminating many places for periods ranging from hours to weeks—with potentially fatal or disabling effects on the population.

Although the direct effects of a large-scale nuclear attack could cause millions of casualties, other millions of Americans could survive the radiation effects by seeking protection in fallout shelters.

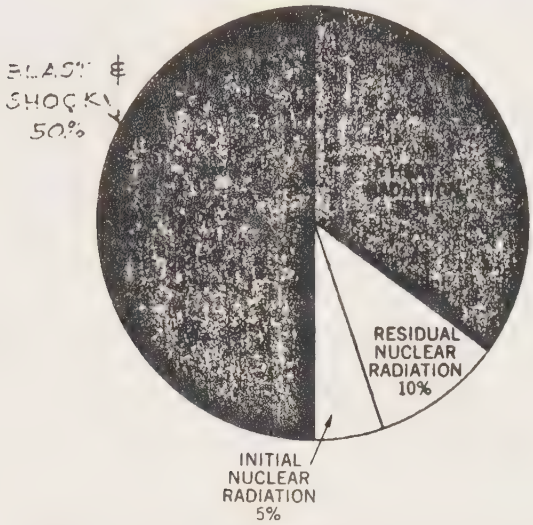


Figure 1 shows the distribution of energy in the explosion of a typical nuclear weapon.

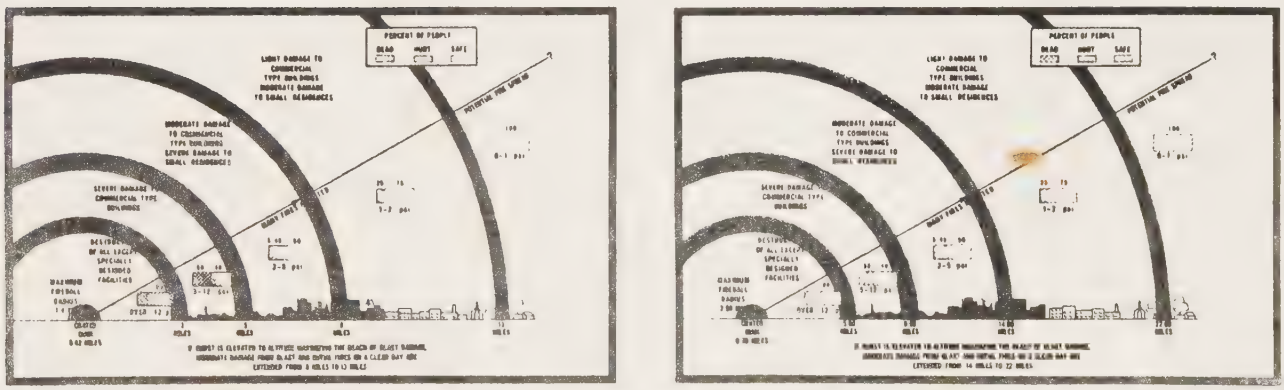


Figure 2 shows the effects of 5- and 25- megaton surface nuclear blasts, respectively.

Figure 3 shows sample radioactive fallout patterns.

3. Mapping

Fire Routes
Emergency Evacuation Routes
Location of Fire Hazards
Location of Geologic Hazards - Seismic Safety Hazard Atlas

These maps are to be prepared by the city. The Kern COG staff will assist if requested.

(THESE MAPS WILL BE INCLUDED DURING THE IMPLEMENTATION PROCEDURE.)

4. Evaluating Potential Hazards

The effects of a fire or geological disaster on an area depend a great deal upon the preventive measures taken ahead of time and the recovery actions taken following the fire or disaster.

The various fire agencies will make every possible effort to save structures during a fire but their effectiveness depends upon the preventive measures taken before the fire. If the brush has been cleared, a fire resistant roof installed, a sufficient supply of water is available, access is provided for the fire equipment, and the structure is in good condition, then there is an excellent chance to avert major damage. The chances decrease proportionately if any of these precautions are not taken.

After a fire, efforts must be made to reduce the hazards the fire and extinguishing efforts may have caused. This could include reseeding areas to prevent mudslides by the individual homeowners. Even if reseeding has been undertaken, precautionary measures should be taken to protect communities or individual structures from mudslides.

The uniform building code was adopted by the city to insure that materials and methods employed in design and construction are adequate to produce structures that are relatively free of hazards.

The effort of geologic features and the hazards they present are discussed in two documents, Seismic Safety Element and the Geology and Earthquake Hazards, Planning Guide to the Seismic Safety Element of Kern County, California. As part of the city's adopted general plan, they become an integral part of the disaster preparedness program.

5. Analysis of Hazardous Land Use Relationships

Averting or lessening the potential effect of natural or man-made disaster can be achieved by regulating the use to which land is put and the materials and methods employed in the design and construction of physical facilities. For example, locating a housing development and utility structure astride identified active geological faults, on potential slide areas, or unstable fills, or on flood plains is not a wise use of that particular land.

Governmental concern with safe land use and adequate construction practice is based on both humanitarian and economic considerations. With the concentration of a large percentage of the population in urbanized areas susceptible to natural disasters, great numbers of people are in jeopardy.

6. Acceptible Risk

With maximum citizen input "acceptible risk" can be determined. Any attempt to develop the appropriate planning response to potential hazard involves a judgement either explicit or implicit of how much risk is acceptable. It is recognized that there is no such thing as a perfectly hazard-free environment. Natural and man-made hazards of some kind and degree are always present. However, efforts can be productively undertaken to try to mitigate the consequences of known hazards.

In the context of this Safety Element, the problem of risk is one of public policy and the appropriate allocation of public resources to mitigate hazards. The central question is, "How safe is safe enough?" The planner's responsibility is to provide a framework in which a communitywide, as opposed to an individual, response to the question can be meaningful. The first of several essential steps is the recognition of the presence of a hazard. Much of the planning of the past has proceeded without enough knowledge of the natural forces at play in a given area.

Once a problem has been recognized, considerable effort is required to evaluate its likely severity, frequency, and the characteristics of the area involved. This step should take into account the benefit/cost ratio of reducing hazard, acknowledging the intangibles involved, and comparing it with that of other projects. The factors of voluntary and involuntary exposure to risk must be considered in reaching a decision.

The results of vulnerability analyses are generally displayed in the form of a "risk map," which partly the type and degree of hazard represented by a particular natural phenomenon in a given geographic location. Earthquake risk maps, for example, identify faults, and the underlying geological conditions of the locality, flood plain mapping indicates the areas likely to be covered by water during floods of given magnitudes, and forest-cover mapping estimates the vulnerability of woodlands to fire.

After all of the identifiable features have been listed it still remains for the city to determine the degree of risk it is willing to support in light of the known risk and the cost in dollars and relinquished property rights.

The individuals and planning commissions preparing land-use plans, construction standards, model codes, and actual regulations have relied on their own judgement as to the degree of severity of the disaster to be considered in any given locality. In the case of ground shaking, they must decide whether structures in potential landfall areas should withstand loads generated by accelleration forces of 1.0 g or some higher amount.

Because of the many people involved and their varied background and experience, different assumptions are made and different conclusions reached. Accordingly, there is a need for a nationally recognized set of disaster mitigation criteria dealing with the major disasters.

7. Mitigation Efforts

Like protection, disaster mitigation begins with an estimate and appreciation for an area's vulnerability to natural disaster. The objective of mitigation is to find ways to reduce the vulnerability of people and property to damaging effects. The results of vulnerability analyses are generally presented in the form of "risk maps" which portray the type and degree of hazard represented by a particular natural phenomenon in a given geographic location.

Even after knowledge of the hazards associated with a given locality have been identified and incorporated into land-use regulations, additional hazard mitigation measures can be taken for future developments by specifying that structures be adequately designed, constructed, operated, maintained and eventually — removed.

The data developed by these risk mapping activities can be used by the city to regulate future land use to mitigate the effect of disasters. Areas of extreme risk can be left undeveloped.

Even after the hazards associated with a given site have been identified and incorporated into land-use regulations, additional hazard-mitigation measures can be taken by specifying that structures be adequately designed, constructed, operated, maintained and — eventually — removed.

8. Regulations

The data developed by inventorying hazardous fire conditions and natural features can be used to regulate future land use to mitigate the effect of disaster. Areas of extreme risk can be zoned for open space uses; areas of medium hazard can be zoned to low density occupancy, while prohibiting the location of emergency service facilities in such areas.

Adoption of the Uniform Building Code is a requirement for the regulation of building to protect the safety, health and welfare of the public. Building codes integrate with construction standards with legal and administrative procedures and present them in a systematic and codified manner for the use of the city.

9. Information Exchange

It is important that governments program for emergency response be presented to the public but the administration be accomplished through existing organizational arrangements, augmented as necessary. This approach should result in greater identification of government officials with their citizens during time of extraordinary needs. Citizens should be consulted during the planning stage of the program and be involved in its operation. It is a logical extension of government-citizen relationship dealing with day to day emergencies.

The main focus of information exchange regarding emergency response to major disaster should be:

a. Public understanding of expanded routine emergency services during disaster alert, such as police, fire-fighting, sanitation, and medical care.

b. Information about provisions that will be made to individual citizens; those things that he takes care of by himself in normal times but have been interrupted, such as food, housing and personal welfare.

c. Procedures that will be made to make provisions for emergency medical care.

APPENDIX 1

DEFINITIONS AND TERMS

AREA CENTER	The control center of the next higher echelon in the channel of coordination.
AREA COORDINATOR	The next-up coordinator; i.e., city coordinator, county coordinator, etc.
CONTINGENCY	A possibility, or not unlikely event or condition.
DEFENSIBLE SPACE	A land use planning concept of urban space designed to inhibit crime by utilizing the proprietary concerns of residents. Key ingredients in designing defensible space include: improving the natural capability of residents to visually survey the public areas of their residential environment; enhancing spheres of territorial influence within which residents can easily adopt proprietary attitude; and enhancing safety through the strategic geographic location of intensively used community facilities.
DISASTER ASSISTANCE CENTER	A facility established within or adjacent to an area affected by a natural disaster for the purpose of providing disaster victims a "one-stop" service in meeting their emergency and/or rehabilitation needs. It will be staffed by appropriate representatives of federal, state, and local governmental agencies, private service organizations, and certain representatives of the private sector.
EVACUATION MAP	Map showing potential area that would be flooded in the event of a dam failure.
MASS CARE FACILITY	A location, such as a school, at or from which lodging, feeding, clothing, registration, inquiry and essential social services can be provided to disaster victims during the immediate post-disaster period.
MULTI-PURPOSE STAGING AREA (MSA)	A pre-selected location having large parking areas and shelter for equipment and operators, such as major shopping center, high school or university. The MSA also provides a base for coordinated emergency operations, a rally point for mutual aid coming into an area, and a staging area for post-disaster population support and recovery activities.

ACCEPTABLE RISK	The level of risk below which no specific action by local government is deemed to be necessary.
AVOIDABLE RISK	Risk not necessary to take because individual or public goals can be achieved at the same or less total "cost" by other means without taking the risk.
UNACCEPTABLE RISK	Level of risk above which specific action by government is deemed to be necessary to protect life and property.

APPENDIX 2

REFERENCES

- Guidelines for Local General Plans, by Council on Intergovernmental Relations

- Seismic Safety Element

- Geology and Earthquake Hazards Planning Guide to the Seismic Safety Elements of Kern County, California

APPENDIX 3

BIBLIOGRAPHY

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APPENDIX 4

The Community Preparedness Checklist

Is your city ready for disaster? Take the following test and find out. For more details, see Standards for Local Civil Preparedness—Summary for Public Officials, published by the Civil Defense Preparedness Agency, Department of Defense. Copies are available through state civil preparedness offices.

Is your locality served by a full-time, professional civil preparedness (civil defense) director, to fit together the planning and preparation by all governmental departments to deal with peacetime disasters or the effects of nuclear attack?

If your city doesn't have a full-time civil preparedness director, do you have a paid part-time director, who also serves local government in some other paid capacity?

Do you encourage your civil preparedness director to attend courses available in the state through the Civil Defense University Extension Program, or at the Defense Civil Preparedness Staff College at Battle Creek, Michigan?

Does your city's civil preparedness director report to the chief executive?

Do the chief executive and the heads of operating departments understand that the role of the civil preparedness director is to coordinate emergency planning and operations by all local departments, on behalf of the chief executive—not to act as an operating department head, or to "take over" in case of an emergency?

Is your civil preparedness director (and staff, if any) under a career or civil service system?

Has a "hazard analysis" been made of major threats your city could face—such as tornado, earthquake, major industrial or transportation accident, hurricane, or enemy attack effects?

Does your community have a local warning system which can get warning to all your citizens of peacetime hazards or enemy attack?

Does your city have an Emergency Operating Center (protected control site, with communications to all city forces) where key executives can receive information on a disaster, and make coordinated decisions on operations required by the emergency?

Is the Emergency Operating Center providing day-to-day benefits to your community (e.g. being used for police, fire, or ambulance dispatching)?

Does your locality have an up-to-date emergency operations plan, covering all likely peacetime or attack hazards?

Was the emergency plan developed by a team including planners from all major operating departments, rather than solely by the civil preparedness director?

Have your chief executive and department heads participated in emergency exercises, based on simulated disasters affecting your jurisdiction, to check disaster plans and decision-making in major emergencies?

Does your community's emergency organization include means to get advice and information to the people in case of disaster, via local news media?

Are hospital, school and industrial emergency plans tied in with the overall plan?

Has your locality trained radiological monitors, for service in case of peacetime incidents involving radioactive materials, or to monitor fallout in case of nuclear attack?

Does your jurisdiction have a "community shelter plan" covering advice for the citizens on where to go and what to do in case of attack upon the United States?

Has the community's level of readiness for major emergencies been evaluated by the chief executive and department heads, and an "action plan" prepared—covering specific actions to improve emergency readiness?

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